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IS 10198 (1982): Carbon Steel, Safety Razor Blades [PGD 14: Consumer Products and Allied Equipments]

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“Knowledge is such a treasure which cannot be stolen”





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IS : 10198 - 1982

*Indian Standard*  
SPECIFICATION FOR  
CARBON STEEL, SAFETY RAZOR BLADES

UDC 687.53.052 : 672.715.34 : 669.14



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INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

Gr 3

November 1982

AMENDMENT NO. 1 APRIL 1989

TO

IS:10198-1982 SPECIFICATION FOR CARBON STEEL,  
SAFETY RAZOR BLADES

(Page 6, clause 9.3, last sentence) - Add 'edge' between the words 'blade' and 'is'.

(Page 9, clause B-3.1, last sentence) - Substitute the following for the existing sentence:

'with each blade the operator shall be required to shave on consecutive days till the blade has become unsatisfactory (see B-4.1) for use.'

(Page 10, clause B-4.2) - Substitute the following for the existing clause:

'B-4.2 The number of shaves where the score per shave is three or above for all the 15 blades and the corresponding scores shall be totalled up separately and average number of shaves per blade and average score per shave shall be calculated. The blades shall be considered satisfactory with regard to the performance requirements, when the following criteria are fulfilled:

- a) The average number of shaves per blade is 2.0 or more, and
- b) The average score per shave is 3.5 or more.

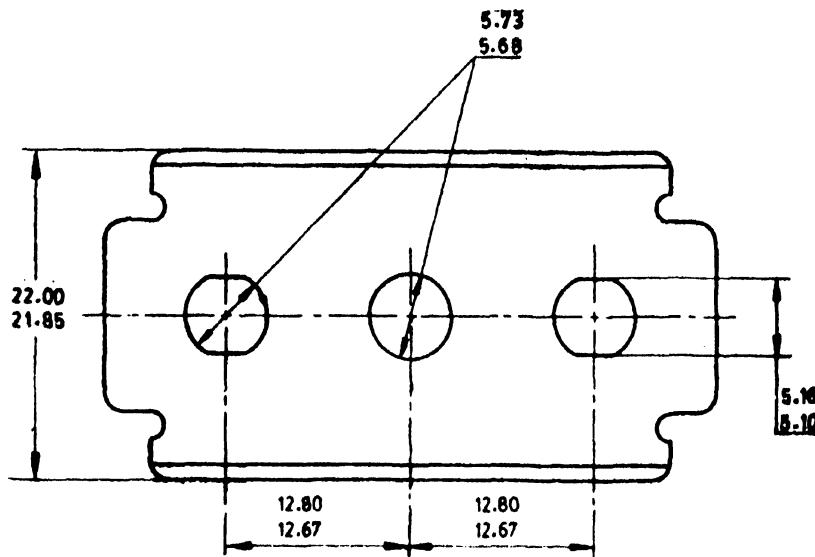
(CPDC 32)

AMENDMENT NO. 2 NOVEMBER 1989  
TO  
IS : 10198 - 1982 SPECIFICATION FOR CARBON  
STEEL, SAFETY RAZOR BLADES

( *Page 4, Fig. 2, informal table, col 2* ) — Substitute '21.85' for '21.90' and '22.0' for '22.04' for dimension A.

( *Page 4, clause 5.1.1* ) — Insert the following new clause 5.1.2 and Fig. 3 after 5.1.1:

**5.1.2** The critical dimensions of the blade for pin type razor shall be as shown in Fig. 3.'



All dimensions in millimetres  
FIG. 3 STAINLESS STEEL SAFETY RAZOR BLADE ( PIN TYPE )

( CPDC 32 )

# *Indian Standard*

## SPECIFICATION FOR CARBON STEEL, SAFETY RAZOR BLADES

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*Indian Standard*  
SPECIFICATION FOR  
CARBON STEEL, SAFETY RAZOR BLADES

**0. F O R E W O R D**

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 21 April 1982, after the draft finalized by the Hair Cutting, Shaving, Shearing and Allied Equipment Sectional Committee had been approved by the Consumer Products and Medical Instruments Division Council.

**0.2** The carbon steel, safety razor blades were earlier covered along-with stainless steel safety razor blades in IS : 7371-1977\*. Since the raw material and quality control, of the carbon steel blades is different from manufacturing process of the stainless steel blades, the concerned sectional committee decided to cover the carbon steel blades under a separate standard.

**0.3** This standard is a necessary adjunct to IS : 7370-1974†.

**0.4** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960‡. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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**1. SCOPE**

**1.1** This standard covers the requirements for double-edged safety razor blades, made of carbon steel, used for shaving.

**2. TERMINOLOGY**

**2.0** For the purpose of this standard, the following definitions shall apply.

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\*Specification for blades, razor, safety (*first revision*).

†Specification for razors, safety.

‡Rules for rounding off numerical values (*revised*).

**2.1 Bevels** — Sloping surfaces of the blade near the cutting edge ( see Fig. 1 ).

**2.2 Nick** — A chipped out, broken out, indented, bent out, semi-circular projection or any similar gap, indentation or projection on the cutting edge.

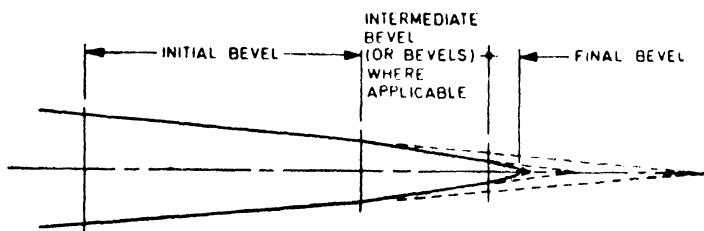


FIG. 1 CROSS SECTION PERPENDICULAR TO CUTTING EDGE

### 3. TYPES

**3.1** The safety razor blades shall be of the following types, depending upon their thicknesses:

a) Thick	$0.127 \pm 0.007$ mm
b) Medium	$0.100 \pm 0.005$ mm
c) Thin	$0.080 \pm 0.005$ mm

### 4. MATERIALS

**4.1** The carbon steel used for the manufacture of razor blades shall conform to IS : 9476-1980\*.

### 5. SHAPE AND DIMENSIONS

**5.1** The general shape of the razor blade is given in Fig. 2. Dimensions *A* and *F* of the blade shall be as given in the table under Fig. 2. The final bevel angle of each cutting edge shall be between  $15^\circ$  and  $25^\circ$  ( see 9.4 ).

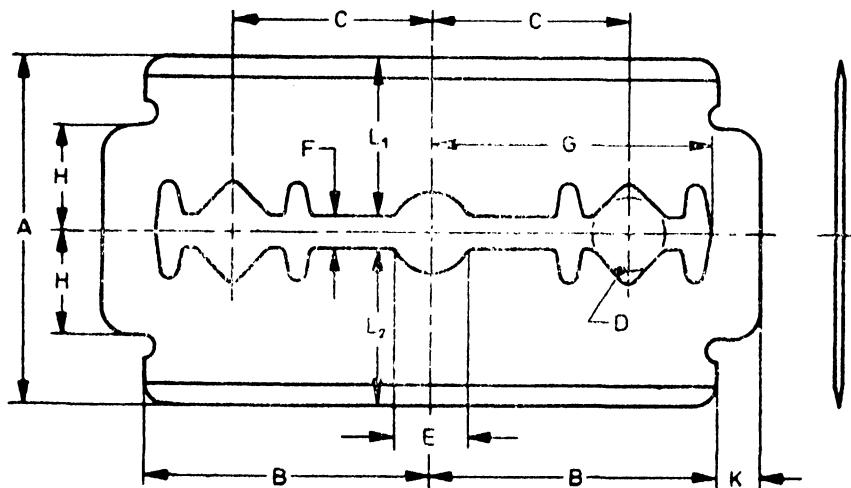
NOTE — The other dimensions given in the table are recommended dimensions.

**5.1.1** Blades shall fit 'pin' style, 'bar' style, and 'end-located' style or a combination of bar and end-located style blade alignment-patterns for razors, as given in IS : 7370-1974†, without excessive or insufficient blade

\*Specification for cold-rolled steel strips for carbon steel razor blades.

†Specification for razors, safety.

exposure and shall have sharp edges for satisfactory shaving. The difference of  $L_1$  and  $L_2$  ( see Fig. 2 ) shall not vary by more than 0.10 mm.



Dimensions	A	B	C	D Dia of Inscribed circle	E Dia	F	G	H	K
Minimum	21.90	18.41	12.67	4.95	4.98	2.06	17.86	—	2.21
Maximum	22.04	18.64	12.80	5.08	—	2.21	—	6.60	—

All dimensions in millimetres.

FIG. 2 CARBON STEEL SAFETY RAZOR BLADE

## 6. WORKMANSHIP AND FINISH

**6.1 Cutting Edges** — Both sides of the blade at the cutting edge shall be honed and stropped. When viewed under a magnification of 100 $\times$ , the final honing bevel shall either be hollow or flat, smooth and continuous, throughout the length of each edge and shall be free from marks made by grinding and rough honing operations. The initial, intermediate ( if present ) and final bevels shall be separate and parallel to the cutting edge of the blade.

When viewed under a magnification of 100 $\times$ , the cutting edges of the blade shall be free from defects like bent edges, jagged edges, honed edges gouged out, one side not honed and bent-over edges.

When viewed under a magnification of  $100\times$ , blades shall not have on an average more than three nicks per blade edge, of a size larger than 0.01 mm and these shall not in any case be closer than 6.5 mm.

**6.1.1** Any nick 0.01 mm or smaller, or any nick appearing in the chamfered or curved portion at the ends of the cutting edges shall not be counted, but a series of nicks ( 0.01 mm or smaller ) forming a serrated edge or un honed cutting edge shall not be permitted.

**6.2 Straightness and Parallelism of Cutting Edges** — When checked on top of the cutting edge along the full length of the blade, each cutting edge shall be straight to within 0.04 mm. The two cutting edges shall be straight and parallel to within 0.08 mm, so that when measured at the two ends and at least three intermediate positions, there shall not be variation in excess of 0.08 mm in the maximum and minimum perpendicular measurements between the two cutting edges.

**6.3 Finish** — The blade, when it reaches the consumer, shall be in a clean and new condition, free from dirt and dust.

## 7. TREATMENT

**7.1 Protection from Corrosion** — The finished surface of each blade including the bevelled cutting edges, may be coated with a protective film that will prevent corrosion. The protective film shall not have any ingredient which will cause skin irritation. To provide greater corrosion resisting qualities, the blades may also be coated with suitable lacquer on both flat sides.

**7.1.1 Coating** — The cutting edges of the blades may be treated with a suitable coating to ensure a smooth shave in the supplied condition.

## 8. SAMPLING

**8.1** The number of safety razor blades to be selected from a lot for ascertaining conformity to the requirements of this specification shall be as agreed to between the supplier and the purchaser. A suitable sampling scheme and criteria for conformity is recommended in Appendix A.

## 9. TESTS FOR FINISHED BLADE

**9.1 Hardness Test** — The hardness of blades shall be determined by a Vickers micro hardness testing machine in accordance with IS : 9258-1979\*. The hardness tested at two or more places at each edge of the blade, about 1 to 2 mm away from the cutting edges, shall be not less than 500 HV. The load recommended for hardness test is 800 to 1 000 g.

\*Method for Vickers micro-hardness testing of metals.

**9.2 Flexibility Test** — The blades shall be tested for flexibility as prescribed in 9.2.1 and 9.2.2.

**9.2.1** The thick blades shall be tested for flexibility by bending around a smooth steel bar 45 mm in diameter when flexed along the long axis of the blade, and around a smooth steel bar 38 mm in diameter when flexed along the short axis. The blades shall be flexible and shall not break or crack on bending.

**9.2.2** The medium and thin blades shall be tested for flexibility by bending around a smooth steel bar 38 mm in diameter when flexed along the long axis of the blade, and around a smooth steel bar 32 mm in diameter when flexed along the short axis. The blades shall be flexible and shall not break or crack on bending.

**9.3 Microscopic Examination** — Oil, grease, protective film, lint and other adherent particles shall be removed from the cutting edges of the sample blades by any suitable means which shall not damage the blade edge. The blade edge shall then be placed in the microscopic field and adequately illuminated for clear vision. The size of the nicks in the blade edge shall be measured by a field microscopic eye piece with 0.01 mm graduations, at 100 $\times$  magnification. Nicks greater than 0.01 mm in size in any direction shall be counted, and the number of nicks in the blade edges shall be divided by the number of blade edges examined. If the average number of nicks per blade is greater than 3.0, the blade shall be considered as not conforming to this standard.

**9.4 Final Bevel Angle Test** — The final bevel angle of the blade edges shall be measured by a suitable method, preferably by means of a microscope and rectilinear beam of light from a source movable in a plane perpendicular to the blade bevel. Blades with final bevel angle of the cutting edge not within the range of 15° to 25° shall be considered as non-conforming to this standard. The final bevel angle shall also be uniform through the length of the cutting edge.

**9.5 Performance Test** — When tested in accordance with the method given in Appendix B, the carbon steel blade shall give at least two shaves.

## **10. MARKING**

**10.1** Each blade or the dispenser shall be legibly and indelibly marked either with the manufacturer's name or trade-mark or identification mark.

**10.1.1** The outer packing of each blade may also be marked with the ISI Certification Mark.

**NOTE** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## 11. PACKING

**11.1** The packing shall be in accordance with the acceptable trade practice or as agreed to between the purchaser and the supplier. When the blades are not having the marking, they shall be packed in a temper proof dispenser.

## A P P E N D I X A ( *Clause 8.1* )

### SAMPLING SCHEME AND CRITERIA FOR CONFORMITY FOR CARBON STEEL, SAFETY RAZOR BLADES

#### A-1. LOT

**A-1.1** All the blades in a consignment of the same type and material and manufactured under relatively similar conditions of manufacture shall constitute a lot.

**A-1.2** For ascertaining the conformity to the requirements of this specification, inspection and testing shall be carried out separately on each lot.

#### A-2. VISUAL EXAMINATION

**A-2.1** Visual examination shall be made for the defects listed in **A-2.2**. The scale of sampling and acceptance numbers shall be in accordance with Scale I in Table 1. This scale has an Acceptable Quality Level ( AQL ) of 4.0 for total defects expressed in terms of defects per 100 units.

**A-2.2** By visual examination the following classes of defects shall be observed:

- a) Wrong type ( *see 3.1* );
- b) Hone marks not eliminated from cutting edges; or edges not honed; or edges serrated, chipped, jagged, etc; or edges bent; or blades broken or cracked ( *see 6.1* );
- c) Treatment missing or not as specified ( *see 7.1* and **7.1.1** ); and
- d) Marking missing or incorrect or illegible or incomplete ( *see 10.1* and **10.1.1** ).

### **A-3. DIMENSIONAL EXAMINATION**

**A-3.1** Examination shall be made to determine the compliance with dimensional requirements laid down in the specification ( *see 5.1, 5.1.1, 9.4* and Fig. 2 ). Any dimension not within the specified limits shall be classified as a defect. The scale of sampling and the acceptance numbers shall be in accordance with Scale II in Table 1. This plan has an AQL of 2.5 for total defects expressed in terms of defects per 100 units.

### **A-4. STRAIGHTNESS AND PARALLELISM OF CUTTING EDGES TEST, HARDNESS TEST, FLEXIBILITY TEST, MICROSCOPIC EXAMINATION**

**A-4.1** These tests shall be performed in accordance with the methods laid down in the specification ( *see 6.2, 9.1, 9.2* and **9.3** ). The scale of sampling and the acceptance numbers shall be in accordance with Scale III in Table 1. This scale has an AQL of 2.5 percent. A blade is considered as defective if it fails to pass the requirement of any one or more of the tests.

**TABLE 1 SCALE OF SAMPLING AND ACCEPTANCE NUMBER**  
( *Clauses A-2.1, A-3.1 and A-4.1* )

LOT SIZE ( NO. OF BLADES IN THE LOT )	SCALE I		SCALE II		SCALE III	
	Sample Size	Acceptance Number ( Defects )	Sample Size	Acceptance Number ( Defects )	Sample Size	Acceptance Number ( Defects )
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Up to 300	20	2	8	0	3	0
301 to 1 000	32	3	13	0	5	0
1 001 to 3 000	50	5	20	1	13	0
3 001 to 10 000	80	7	32	2	20	1
10 001 and above	125	10	50	3	32	2

## **A-5. PERFORMANCE TEST**

**A-5.1** Fifteen blades shall be selected at random from each lot and tested for performance in accordance with 9.5 and Appendix B. They shall be considered having satisfied the requirements of this standard if the criteria set in Appendix B is satisfied.

## **A P P E N D I X B**

*( Clause 9.5 and A-5.1 )*

### **PERFORMANCE TEST FOR CARBON STEEL BLADES**

#### **B-1. GENERAL**

**B-1.1** The test shall be carried out on 24  $\pm$  2 hours old human 'stubble'.

#### **B-2. PROCEDURE**

**B-2.1** The blade shall be fitted to a safety razor conforming to IS : 7370-1974\* and the operator shall shave using his usual shaving technique with shaving soap conforming to IS : 5784-1970†. The operator shall also follow the guidelines for the use of the blades as given by the manufacturer of the blades.

#### **B-3. SIZE OF THE PANEL OF OPERATORS AND THE NUMBER OF BLADES TO BE TESTED**

**B-3.1** For evaluating the performance, a panel consisting of five operators who are regular users of carbon steel blades shall be formed. Each operator shall be given a packet of blades and shall be required to evaluate the performance of three blades from the packet. With each blade the operator shall be required to shave on consecutive days.

#### **B-4. EXPRESSION OF RESULTS AND EVALUATION OF THE PERFORMANCE**

**B-4.1** An operator shall grade the satisfactoriness of the shave ( with regard to smoothness and closeness of the shave ) on each day by awarding points in a scale of five. For the purpose of the standard, the points 1 to 5 on the scale shall indicate the performance as follows:

- Point 1 Very unsatisfactory
- Point 2 Unsatisfactory

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\*Specification for razors, safety.

†Specification for shaving soap.

Point 3 Average ( neither unsatisfactory nor satisfactory )

Paint 4 Satisfactory

Point 5 Very satisfactory

**B-4.1.1** The performance shall be reported for each shave individually.

**B-4.2** All the scores given for individual shaves for all the blades and by all the operators shall be totalled up and an average performance score for a single shave calculated. The blade shall be considered satisfactory with regard to performance requirement, only if the average score per shave is 3.5 or more.

# INTERNATIONAL SYSTEM OF UNITS ( SI UNITS )

## Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

## Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

## Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s <sup>2</sup>
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m <sup>2</sup>
Frequency	hertz	Hz	1 Hz = 1 c/s (s <sup>-1</sup> )
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m <sup>2</sup>

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